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ABSTRACT

This research review discusses the use of traditional psychometric devices to predict an individual's academic performance, and to determine his admittance into a particular curriculum, particularly in today's open-door, comprehensive, community-junicr college. To begin with, most reported uses of the typical achievement or aptitude test appear to ignore such critical elements as: (1) factors influencing the size of the validity coefficient, (2) descriptors of the sample used for correlations, (3) the standard error of estimate, and (4) standardized regression coefficients (betas) in the actual regression equations. In addition, past research has demonstrated that little can be meaningfully added to high schocl GPA as a predictor of college success. A more appropriate alternative is to determine entry-level skills required by a particular course or curriculum, and to develop procedures that permit evaluation of these skills. This encourages course and curricular admission criteria to be related as closely as possible to course content, rather than to a construct called academic aptitude (a construct whose only operational definition is a test score). Such an approach can be implemented through counseling and encouraging students to attempt only those courses for which they have a high probability of success. (JO)

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# ENTRANCE AND PLACEMENT TESTING FOR THE JUNIOR COLLEGE

## Prologue

During the spring of 1970, an organization of junior college institutional research people, at their bi-monthly meeting, invited a speaker who is a professional tester from a large and prestigious testing service. His topic was entrance and placement testing in the junior college. At the conclusion of his prepared but informal talk, I asked him to name one junior college, four-year college, or university that used entrance and placement testing programs appropriately—and he was unable to do so. Though he was intimately familiar with dozens of testing programs throughout the country, and presumably very knowledgeable about mental and psychological tests, he could not recommend a single institution of higher education that could serve as a model for the colleges represented at the meeting.

This paper will first describe, in a general fashion, the uses made of entrance and placement tests in the junior colleges as reported in documents submitted to the Clearinghouse. Second, it will examine in detail the psychometric model and its assumptions as reflected by junior colleges' use of standardized tests. Third, it will make recommendations for an alternative approach to the testing programs presently being implemented by junior colleges.

## Research on Testing Programs in the Junior College

A previous *Research Review* by Roueche and Boggs (January 1968) listed 21 Clearinghouse papers on entrance and placement testing. Of those listed, nine were described and commented on (kindly) by the authors. At that time, almost all the research papers dealt either with the development of local norms for standardized tests or with the use of test scores in predicting academic success. For the present *Research Review*, a search of the Clearinghouse material on entrance and placement testing yielded 43 additional papers in the same area. In reading through all of these, I conclude nothing has changed in the last three years. Junior colleges continue to develop local norms and use various standardized tests to attempt to predict academic success.

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Typical of the papers developing norms are: Diablo Valley College (ED 010 737), which reports percentile of norms on SCAT; Los Angeles City College, which has been using the SCAT for many years and reports a consistency over time in their student population on this test; the Virginia State Council for Higher Education, (ED 012 183), where SAT norms were developed, used CEEB scores; and Daytona Beach Junior College (ED 015 725) has developed its own norms for both SCAT and STEP. Virginia and Daytona have separate norms for different curricula, including one set using over 200 pre-engineering students.

Most papers on testing submitted to the Clearinghouse report studies on the prediction of academic success. A number of these, in the Northwest particularly, examine the Washington Pre-College Test as a predictor (ED 012 624, ED 017 248, ED 032 043). Others use the SAT or ACT scores to compute their correlations and develop their regression equations (ED 012 181, ED 011 196, ED 029 626). In general, the results give zero order and multiple correlation ranging from .50 to slightly over .60. Though some of the studies report the actual regression equations, those that do so use "b-weights" rather than betas and seldom keep an uncontaminated holdout sample for cross-validation.

A few studies using the same model introduce both normative data and non-cognitive test scores to help improve their prediction. The predictor variables are usually high school grade point average (computed in a number of ways), the Edwards Personal Preference Schedule (ED 024 374), and student responses to questionnaires (ED 013 628).

Almost all the research reports that use high school grade point average as a predictor for college success find, as has been found for decades, that it is the best predictor. As most race track touts know by instinct, and psychometricians by logic, past performance is the best predictor of future performance. From the Clearinghouse reports and articles appearing in refereed journals, I am convinced that little can be meaningfully added to high school grade point average as a predictor of success in college—neither test scores nor personality variables.

## The Psychometric Model and Abuses Thereof

There is one commonality in all the test studies submitted to the Clearinghouse: none of them questions the appropriateness of the traditional psychometric model they use for education in general and the open-door comprehensive community college in particular.

Let us assume, for the moment, that the classical psychometric model can be of some use to the junior college, that it can, in some mysterious way, improve the education we are peddling. Gross discrepancies remain between what the sophisticated psychometrician would advocate and what is being done. Certainly, a philosophical gap exists between the use of test scores as admission criteria to particular curricula, and the statement of philosophy that is summarized by the phrase "open-door college." Though it appears that test results are not used to deny students admission to a community college, it is equally evident that the student's academic life is much affected by the scores he receives. It is on the basis of these that he is granted or denied permission to take specific courses or to enter certain certificated programs, particularly the para-professional curricula. As a consequence, the probability of his continuing his formal education or completing a specified curriculum, is considerably influenced by the test scores he gets.

It would appear from the documents submitted to the Clearinghouse that junior college researchers either are unaware of the assumptions implicit in the psychometric model or choose to ignore them. For example:

1. The basic assumption that test items are nothing more or less than a sample of behavior (and test-taking behavior at that) seems to have been lost.

2. The concept of validity is frequently used with what appears to be no thought of what the test is valid for. Validity, it seems, is represented by the correlation coefficient between the test or sub-test and grade point average. The particular factors that influence the size of the validity coefficient, or any other correlation, appear to be ignored.

3. Descriptors of the sample used for correlations, such as range of talent or presence of extreme scores, are seldom reported in the studies, though they can frequently account for potentially spurious correlations.

4. The standard error of estimate, a much better concept of predictive validity, is seldom reported and, when it is, appears to be frequently misunderstood or misused.

5. Actual regression equations are scarce in the research reports and, when they are given, they most often include b-weights rather than standardized regression coefficients (betas), making for difficulty in interpretation.

6. In some reports using multiple regression techniques, predictor variables pick up a reverse sign weight, e.g., though there is a positive correlation with the criterion variable, there is a negative value in the equation. At a very high level of probability, this is attributable to a mathematical artifact as opposed to its being a real suppressor variable.

7. It is also evident, from the papers that report regression equations, that many of the predictor variables have such puny weight in the equation that they are "eyewash" as opposed to a real contribution to the existing variables.

8. Few investigators take into account the ipsative nature of correlating any two paper-and-pencil tests. The idea that specific test-taking abilities will add to the size of a correlation seems ignored.

9. Few investigators seem to differentiate between the significance of a correlation and its meaning. Some colleges report hundreds of correlations and scores of t-tests with the same sample of less than a hundred students. They don't seem to know that the significance of a correlation depends almost entirely on the number of cases used to compute it.

10. Though most junior college investigators understand that coefficient of determination ($r^2$) represents the proportion of the criterion variance accounted for by the predictors, they lose sight of the fact that they have computed an "r," using a sample of students as opposed to a "rho" of the true correlation for total population. As a consequence, with $r = .31$, they assume they are accounting for ten per cent of the criterion variance.

Summarizing the above assumptions and criticisms, I conclude the test research is being performed by sincere, dedicated people who are completely naïve about the psychometric model and its assumptions. Further, it seems apparent that little can be added to high school grade point average that will have any meaningful, defensible use in determining which students should take what.

And still college administrators continue to insist on getting scores. They want someone to make the decision about which student should be admitted to Transfer English and which to a registered nursing curriculum. Most important, they want these decisions to be made on some empirical basis, so that they are protected from the antagonism of the community. The person most likely to be given the job will be the director of research, the dean of admissions, the dean of students, or a committee from the department in question.

The kind of "research" used to find the cutting scores normally compares frequency distributions of people who have done well and people who have been put on probation or flunked out. The more sophisticated studies develop a correlation and regression equation with the grade point average as the dependent or criterion variable and the test score as the independent or predictor variable. The ultra-sophisticated use multiple regression and may even add some normative variables as potential predictors (e.g., age, sex, or social class) to a battery of test scores. From a review of the studies submitted to the Clearinghouse, it is evident that most educators, even those responsible for testing, are extremely ignorant of what affects correlations and regression equations, and that they ignore the value and meaning of the standard error of estimate.

The psychometric model is most useful for describing the status of groups. It is next most useful for predicting the performance of groups. It has some utility in describing the status of individuals, but very little in predicting the performance of individuals—*but the latter is what it is most often used to do!*

The validity criterion most frequently used is grade point average and, though few studies are conducted to examine the reliability of this criterion, reliability is a limiting factor on any empirical validity coefficient.

Some junior colleges with tens of thousands of students have no one on the staff capable of serving as test officer. Test scores have become God-given truths to which excellent, caring educators defer in their ignorance when making important decisions about their students.

If a college maintains its faith in classical psychometrics

and desires to improve its use of the testing program to make it less punitive and less out of step with the concept of the open-door college, I have some recommendations.

First, deny access to test results to everyone (including the president of the college) who does not thoroughly understand the statistical concepts of standard error of measurement and standard error of estimate.

Second, hire and train a test officer who thoroughly understands basic measurement concepts. He should know, for instance, that the only real difference between "achievement" and "aptitude" tests is the use made of the results. He should understand that contributions to the size of a correlation and the beta weights of a regression equation are made by extreme cases and range of talent. He should know the dangers involved in spuriously high correlations caused by the ipsative nature of most correlational studies. These ideas should not be just learned and known by a good test officer, but thoroughly incorporated into his professional being.

Third, the college should not accept on faith research studies from national test companies, even such ethical and competent organizations as Educational Testing Service and American College Testing Company. It should rather develop meaningful criterion variables on its own campus and conduct its own validity and norming research.

## An Alternative to the Standardized Test

It is my opinion that the psychometric model, even when properly used, is not only useless, but actually antagonistic, i.e., destructive, in the educative process. It is the psychometricians who foist upon us such insidious constructs as the "normal curve" (any teacher who expects a normal distribution of achievement by his students should be fired outright); "discrimination coefficients" (we're not trying to discriminate, but to teach), and "educational expectancy" (ignoring self-fulfilling prophecy).

The revolution in higher education will shortly be a *fait accompli*. Courses, curricula, and departments are changing radically. The idiotic practice of punitive grading is disappearing. The concepts of recruitment and selection of students using grade point average and standardized test scores are being rapidly revised. Hundreds of colleges are combing the streets, pool halls, and jails of the ghetto and the barrio to get their share of black and Mexican students. Yet we still cling to our entrance tests as to a religious fetish. We treat our testing program as if it were separate and distinct from our instructional program. This should not be the case. The criteria for selecting students for courses and curricula should be related as closely as possible to the content of these courses rather than based on the irrelevancies described by the construct of academic aptitude that has only one operational definition, i.e., the test score.

From the foregoing discussion and from the basic philosophy of the open-door college, it is evident that the use of cutting scores on standardized tests, even when done by experts, is an indefensible practice for the community college. But what are the alternatives?

It is apparent that, if students are permitted to enter any courses or any curricula they choose, the failure and dropout rate will increase exponentially. It follows that we should advise, encourage, and counsel students to enter learning experiences for which they have a high probability of success. The use of standardized tests to predict success is notoriously poor. The use of tests permits us to account for 25% to 40% of the variance in overall grade point average and considerably less in specific courses or subject fields. The logical alternative is to determine as explicitly as possible the entry skills required for a particular course or curriculum and to devise procedures to evaluate the student's mastery of these skills.

The omnipresent example for the comprehensive community colleges is the placement of students in a transfer college English course or in one or more courses in remedial or repair English. The stated purpose of the remedial program is preparation for the transfer course. However, any college that has bothered systematically to appraise the success of remedial English as preparation for college English has found almost total failure. The normal criterion variable for original placement involves grades in high school courses or, more often, scores on standardized English tests. Yet the content of the college English course deals most often with essay writing and, to some extent, analysis of literature. What are the entry skills that are required to write a freshman theme? The armchair English teacher will immediately respond with a list of abilities measured by the standardized tests, i.e., grammar, spelling, vocabulary, mechanics, etc. It seems highly improbable that a test company can pre-determine the objectives a large number of teachers have for their students in any subject matter area. An alternative to the standardized test must be found.

A great deal of effort would be required to specify the skills needed by a student for him to benefit from instruction in writing compositions. However, once this were adequately accomplished, one could place the student in a learning experience that would appropriately lead him to the accomplishment of his objective, i.e., passing freshman English. Meanwhile, using a standardized English test or its ilk and arbitrarily defining cutting scores are antagonistic to every principle espoused by community college philosophy and by anyone who cares about helping people to learn things. It would be more useful simply to have students write sample compositions and let it go at that.

The alternative to standardized tests then is to analyze the goals of the instructional process for any course or curriculum and to help students achieve these goals. The barring of a student from a stated goal on the basis of irrelevant test scores (the practice of most colleges) is the method by which we will perpetuate the sadistic, irrelevant, and pejorative institution of education that has developed in this country. The comprehensive open-door community college cannot remain in the wings, merely following the lead of the academically respectable and educationally irrelevant universities. We must question every quasi-religious belief and procedure we have adopted and extrapolated over the decades. It we don't, our community and our students will.

M. Stephen Sheldon, Director
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